pivalic acid. See trimethylacetic acid.

2-pival yl-1,3-indandi ne. (pivalyl-1,3-indandione; pindone). CAS: 83-26-1. $C_9H_5O_2C(O)C(CH_3)_3$.
Properties: Bright yellow powder or crystals, mp 109C, insoluble in water, soluble in most organic solvents.
Hazard: Toxic by inhalation and ingestion; inhibits blood clotting. TLV: 0.1 mg/m^3 of air.
Use: Rodenticide, insecticide, pharmaceutical intermediate.

pK. A measure of the completeness of an incomplete chemical reaction. It is defined as the negative logarithm (to the base 10) of the equilibrium constant, K for the reaction in question. The pK is most frequently used to express the extent of dissociation or the strength of weak acids, particularly fatty acids, and amino acids, and also complex ions or similar species. The weaker an electrolyte, the larger is its pK. Thus, at 25C for sulfuric acid (strong acid), pK is about -3.0, acetic acid (weak acid), pK = 4.76; boric acid (very weak acid) pK = 9.24. In a solution of a weak acid, if the concentration of undissociated acid is equal to the concentration of the anion of the acid, the pK will be equal to the pH.

Planck's constant. (*h*). A constant that when multiplied by the frequency of radiation gives the quantity of energy contained in one quantum. Equal to $6.626176(36) \times 10^{-19}$ JHz^{-1}.

planetology, chemical. See chemical planetology.

plankton. Microscopic plant and animal life that floats in the oceans or in lake waters.

plant. (1) Any large-scale manufacturing unit including pipelines, reaction equipment, machinery, etc.
(2) A broad group of vegetable organisms comprising all types of vegetation that contain chlorophyll (algae, mosses, grasses, vegetables, trees, etc., but excluding fungi). Their metabolic processes are vital to the maintenance of life on earth and result in the following products: (1) oxygen (from respiration), (2) carbohydrates (from photosynthesis), (3) amino acids and proteins (from nitrates and nitrogen-fixing bacteria), (4) fats and oils, (5) vitamins, (6) natural fibers, (7) coal, (8) various other substances of value such as alkaloid drugs, rubber, etc.
See also photosynthesis, phytochemistry.

plant growth regulator. An organic compound either natural or synthetic that modifies or controls one or more specific physiological processes within a plant. If the compound is produced by the plant itself, it is called a plant hormone, e.g., auxin, which regulates the growth of longitudinal cells involved in bending of the stem one way or another. Substances applied externally also bring about modifications such as improved rooting of cuttings, increased rate of ripening (ethylene), and easier scission (separation of fruit from stem). A large number of chemicals tend to increase the yield of certain plants such as sugar cane, corn, etc. All these, as well as plant-produced hormones, are included in the term plant growth regulator.
See dinitrobutylphenol, kinin, gibberellin, abscisic acid.

plant location. Selection of a site for a new chemical or process industry plant. The problem has been compounded in recent years by the increasing number of environmental regulations and by the energy shortage. Among the more important considerations are: (1) accessibility of essential materials, including water, (2) transportation of finished product (rail, air truck, barge), (3) reliability of fuel and power supply, (4) liquid and solid waste disposal restrictions, (5) commuting distance for employees in view of gasoline consumption, (6) availability of housing for employees, (7) state and local regulations (zoning, hazardous chemicals, building codes), (8) availability of qualified labor, (9) taxation, (10) weather factors (temperature range, severe storms, floods, etc.), (11) expansion possibilities.

"Plasdone" [*International Specialty*]. TM for the pharmaceutical grade of polyvinylpyrrolidone.
Use: Tablet binding and coating agent, detoxicant and demulcent lubricant in ophthalmic preparations, film forming agent in medical aerosols.

"Plaskon" [*Allied-Signal*]. TM for plastics and resins including alkyd, urea, melamine and nylon molding compounds; polyester, coating, foundry, bonding, impregnating, chlorotrifluoroethylene resins, adhesives, hardeners, phenolic laminating varnishes.
210–577 Å. A polyolefin designed for fabrication of tape for insulating computer cable, available in resin form or as specification product.
FR 1050. A flame-retardant polypropylene resin, continuous-use at 100C.
Use: As TV tube sockets, structural parts for appliances, etc.

plasma. (1) The portion of the blood remaining after removal of the white and red cells and the platelets; it differs from serum in that it contains fibrinogen, which induces clotting by conversion into fibrin by activity of the enzyme throm-

Hawley's

Condensed Chemical

Dictionary

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Richard J. Lewis, Sr.

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VNR VAN NOSTRAND REINHOLD COMPANY
N w York

bin. Plasma is made up of more than 40 proteins and also contains acids, lipids, and metal ions. It is an amber, opalescent solution in which the proteins are in colloidal suspension and the solutes (electrolytes and nonelectrolytes) are either emulsified or in true solution. The proteins can be separated from each other and from the other solutes by ultrafiltration, ultracentrifugation, electrophoresis, and immunochemical techniques.

(2) Two kinds of plasma are recognized by physicists, i.e., a particle plasma and a reactor plasma. A particle plasma is a neutral mixture of positively and negatively charged particles interacting with an electromagnetic field, which dominates their motion. Temperatures of 10,000 to 15,000C can be reached. Such plasma, formed by sudden energy releases, can be utilized as an energy source, as in magnetohydrodynamics. Reactor plasmas, on the other hand, are composed of positively charged ions of hydrogen isotopes (deuterium, tritium); the electric charge is the controlling factor. These are used in nuclear fusion devices, where temperatures of 74,000,000C have been attained, and still higher temperatures are expected. These plasmas also respond to electromagnetic forces, which are used to confine them.

See also magnetohydrodynamics, fusion, tokamak.

plasma volume expander. A substance used to partially or wholly replace blood plasma in treatment of the injured. Most important are gelatin, polyvinylpyrrolidone, and dextran.

plasmid. A strand or fragment of genetic material existing outside the chromosomes in certain types of bacteria. R-type plasmids, which are present in *E. coli*, impart resistance to antibiotics in organisms that are exposed to them. The plasmids can be transferred from animals to man, as well as to other, harmful bacteria, which also become resistant to antibiotics. Feeding of traces of antibiotics to animals is believed to promote the growth of *E. coli* and, thus, to produce strains of pathogenic bacteria that are not amenable to antibiotic treatment. For this reason, the FDA has recommended elimination of certain antibiotics from animal feeds, e.g., penicillin, oxytetracycline, and chlortetracycline. Synthetic plasmids have been used successfully in recombinant DNA research.

plasmin. See fibrinolysin.

plasm quin. (pamaquine; plasmochin; 8-dimethylamino-isoamyl-6-methoxyquinoline).
$C_{19}H_{28}N_2O$.
Properties: Yellow powder, mw 300.2. Insoluble in water.
Use: Antimalarial.

"Plastacele" [*Du Pont*]. TM for cellulo
tate flake, a fine white powder used for m
powders, films, sheets, rods, and tubes.

plaster of Paris. See calcium sulfate.

"Plasthall" [*Hall*]. TM for a broad ran
monomeric and polymeric plasticizers us
polymers and elastomers. Types include
ipates, glutarates, trimellitates, azelates, s
cates, and tallates.

plastic. (1) Capable of being shaped or mo
with or without the application of heat.
waxes and moist clay are good examples o
property.
See also plasticity.

(2) A high polymer, usually synthetic, co
bined with other ingredients, such as curativ
fillers, reinforcing agents, colorants, plastici
ers, etc.; the mixture can be formed or molde
under heat and pressure in its raw state and m
chined to high dimensional accuracy, trimme
and finished in its hardened state. The thermo
plastic type can be resoftened to its original con
dition by heat; the thermosetting type cannot.

Plastics in general (including all forms) are
sensitive to high temperatures, among the more
resistant being fluorocarbon resins, nylon, phe
nolics, polyimides, and silicones, though even
these soften or melt above 260C. Other types are
combustible when exposed to flame for a short
time (cellulosics, polyethylene, acrylic polymers,
polystyrene), and still others burn with evolution of toxic fumes (polyurethane).

Engineering plastics are those to which standard metal engineering equations can be applied; they are capable of sustaining high loads and stresses, and are machinable and dimensionally stable. They are used in construction, as machine parts, automobile components, etc. Among the more important are nylon, acetals, polycarbonates, ABS resins, PPO/styrene and polybutylene terephthalate.

Fibers, films, and bristles are examples of extruded forms. Plastics may be shaped by either compression molding (direct pressure on solid material in a hydraulic press) or injection molding (injection of a measured amount of material into a mold in liquid form). The latter process is most generally used, and articles of considerable size can be produced. Because of their dielectric properties, plastics are essential components of electrical and electronic equipment (especially for use within the human body).

Plastics can be made into flexible and rigid foams by use of a blowing agent; these foams are light and strong, and the rigid type is machinable. They are collectively called cellular plastics. Plastics can also be reinforced, usually with glass or metallic fibers for added strength.